DRAFT 4/97

4.3 Test of Temperature in a Wellbore

This test verifies that FEHM has correctly implemented the heat- and mass-transfer problem and 2-D radial geometry. Figures 29 and 30 show that FEHM results are in good agreement with the analytical solution. The results, compared numerically to the analytical solution (found in files *rameyout.analyt_pos* and *rameyout.analyt_time*), are given in Table 45. The maximum absolute error for this run was less than 1.4°C, and the percent errors were less than 3%. These results meet the acceptance criteria for this test suite developed Chapter III.

Table 45. Results of the temperature in a wellbore test

V&V test	Maximum error	Maximum % error	RMS error
Temperature versus time			
d = 0 m	0.2570e-01	0.1285	0.3110e-04
d = 1000 m	1.345	2.815	0.1556e-02
d = 2000 m	1.057	1.358	0.1061e-02
Temperature versus depth			
t = 25 days	0.6971	1.026	0.5203e-03

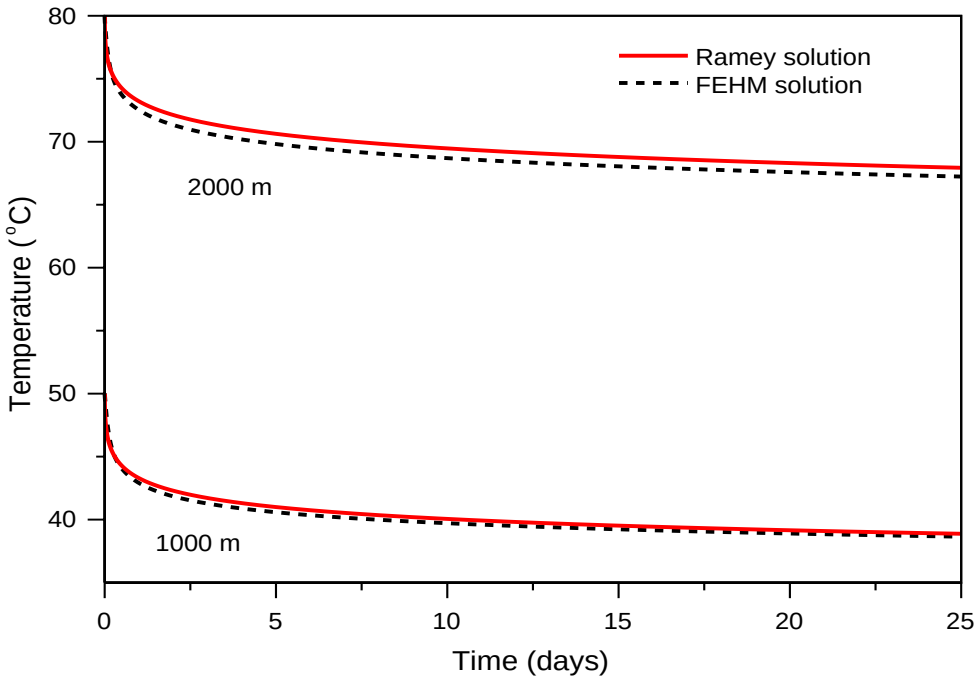

Figure 29. Comparison of FEHM and Ramey analytical solutions for temperature versus time at d = 1000 m and d = 2000 m.

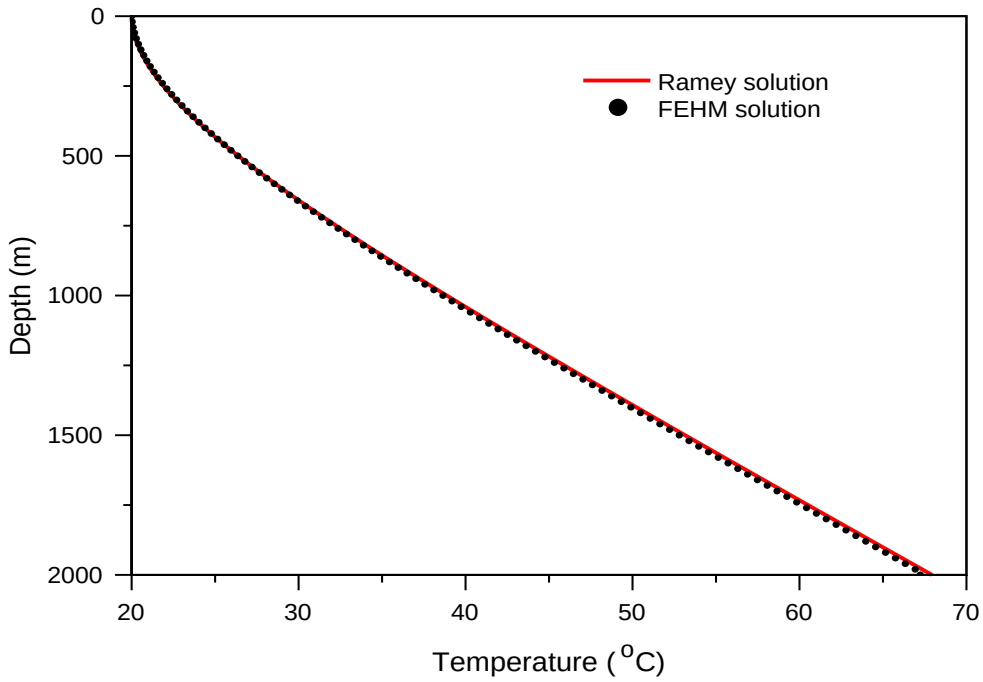

Figure 30. Comparison of FEHM and Ramey analytical solutions for temperature versus depth at t = 25 days.